

NOTES ON GEOGRAPHIC DISTRIBUTION

**Mammalia, Chiroptera, Phyllostomidae, *Lampronycteris brachyotis* (Dobson, 1879):
First record in the state of Paraná, southern Brazil**

Carolina Scultroni,^{1*} Daniela Dias,² and Adriano Lúcio Peracchi³

¹ Universidade Estadual de Campinas, Instituto de Biologia, Departamento de Biologia Vegetal, Programa de Pós-Graduação em Ecologia. Caixa Postal 6109. CEP 13083-970. Campinas, SP, Brazil.

² Fundação Oswaldo Cruz, Laboratório de Biologia e Parasitologia de Mamíferos Silvestres Reservatórios. Avenida Brasil, 4365, Manguinhos. CEP 21040-360. Rio de Janeiro, RJ, Brazil.

³ Universidade Federal Rural do Rio de Janeiro, Instituto de Biologia, Laboratório de Mastozoologia. BR 465, km 47. CEP 23890-000. Seropédica, RJ, Brazil.

* Corresponding author. E-mail: scultroni@gmail.com

During bat field studies conducted at the *Reserva Natural Morro da Mina* (RNMM), an conservation unit in state of Paraná, we captured one specimen of *Lampronycteris brachyotis* (Dobson, 1879). The RNMM, comprises an area of 3,400 ha in Antonina and Morretes municipalities (25°21' - 25°25' S, 48°46' - 48°51' W; Figure 1) in the Paraná coastal plains. The reserve neighbors the *Serra do Mar* and Guaraqueçaba Environmental Protection Areas, in the largest contiguous remnants of Atlantic Forest in Brazil (SOS Mata Atlântica and INPE 2008). The main vegetation types are pioneer formations under marine and river-flooding influence (Veloso

et al. 1991), and the subformations are lowland, submontane, and dense moist forests (Ferretti and Britez 2006). Secondary vegetation occur as well, resulting from the disturbance of the original vegetation. Thus, the reserve is now represented by a mix of initial, middle and advanced states of succession (Marília Borgo, personal communication). Following Köppen's classification, the climate of the region is Cfa, or mesothermic subtropical humid. Average annual temperature is between 20.8 and 22 °C, with annual precipitation above 2,000 mm, occurring mostly from January to March. The average air humidity is 85 % (Ferretti and Britez 2006).

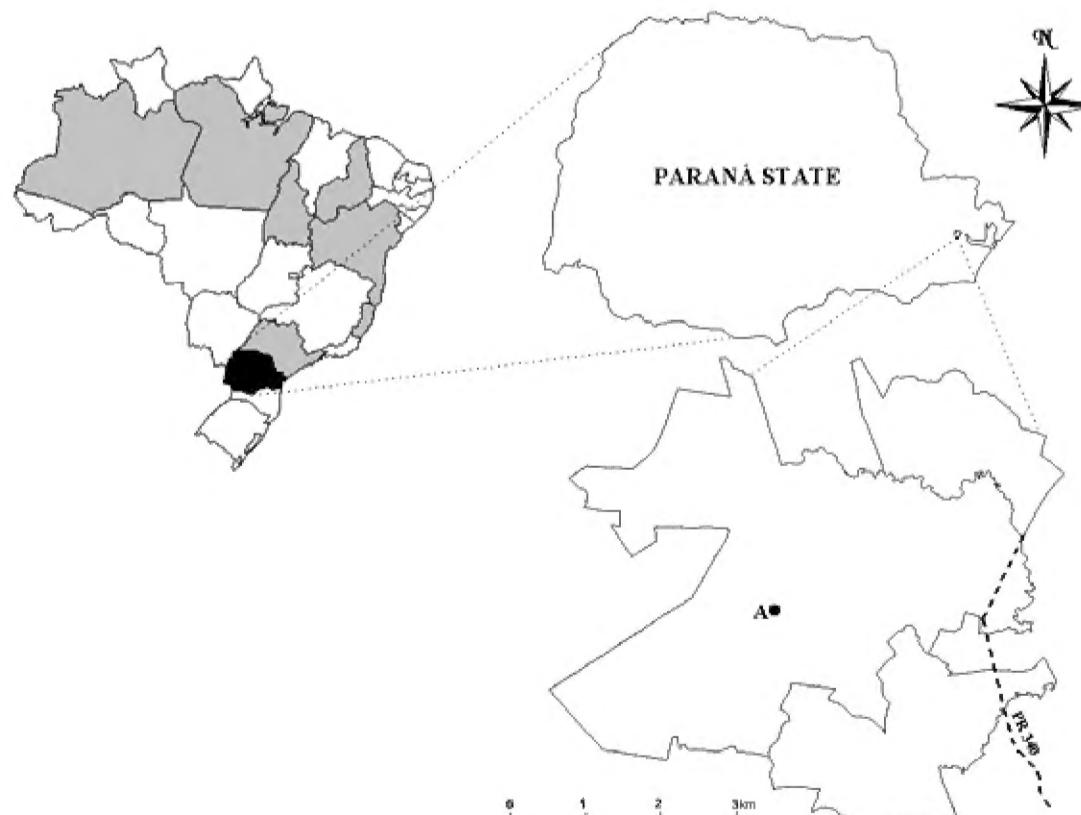


Figure 1. Location of the submontane forest (A) where *Lampronycteris brachyotis* was captured in *Reserva Natural Morro da Mina*, state of Paraná (black). Additional Brazilian states where this species is known to occur are in gray. The dotted line is the highway PR-340.

Bat samplings at RNMM were conducted with mist nets opened from ground to canopy (about 25 m of height) in tree-fall gaps on the "Trilha da Samambaia" ($25^{\circ}22'749''$ S and $48^{\circ}48'415''$ W, 43 m above sea level). This site is located in a submontane forest area that was submitted to selective logging and is in advanced stage of regeneration. The nets (12 x 3 m) were opened after sunset and kept opened until dawn in May 2008 to March 2009, three nights per month. The total netting effort, calculated following Straube and Bianconi (2002), was $64,584 \text{ m}^2 \times \text{h}$. This effort resulted in 464 captures of 20 bat species.

The specimen of *L. brachyotis*, an adult male with scrotal testis, was captured in 29 March 2009, at 19:53 h, after 299 hours of effort, at seven meters height. This species forages mainly next to trees' canopy, where it catches insects on the foliage (Weinbeer and Kalko 2004). It also has an unique behavior among insectivores Phyllostominae, capturing prey during the flight, above canopy (Weinbeer and Kalko 2004). The collected individual is preserved in 70 % alcohol and deposited in the Mastozoological Collection of the *Museu de História Natural Capão da Imbuia* (MHNCI), in Curitiba, Paraná, under the number MHNCI 6181 (research authorizations process IBAMA # 10004 and # 10004-2; IAP # 05/07).

Measurements (in mm) of the specimen studied, obtained according to Taddei et al. (1998) and

using a caliper with precision of 0.02 mm, are: length of forearm 41.80; ear length 15.60; hind foot length 12.68; calcar length 13.30; third metacarpal 38.36; fourth metacarpal 37.72; fifth metacarpal 37.40; greatest length of skull (excluding incisors) 22.44; condyloincisive length 20.26; basal length 17.90; palatal length 10.66; length of maxillary tooth row 8.48; breadth across upper canines 4.10; breadth across upper molars 6.86; postorbital breadth 5.20; zygomatic breadth 11.12; breadth of braincase 8.98; mastoid breadth 10.26; mandibular length 14.46; length of mandibular tooth row 8.98.

The specimen (Figure 2) has all characters reported to *L. brachyotis* (Sanborn 1949; Medellín et al. 1985; Genoways and Williams 1986; Nogueira et al. 2007): dorsal fur orange brown, with pale orange basis; head, face and throat bright orange; ventral fur pale orange; ears, wings and interfemural membranes dark brown; calcar longer than foot; pinnae short and with pointed tips; interauricular band absent; third metacarpal longest, fifth shortest; second phalanx of wing digits III and V longer than first; orbital foramen between the second upper premolar and the first molar; first pair of upper incisors chisel-shaped and in line with canines; second pair of upper incisors bifid, with more elongated inner cusp, and in contact with central incisor; second lower premolar reduced relative to both first and third, which are subequal in size.



Figure 2. Male *Lampronycteris brachyotis* captured in *Reserva Natural Morro da Mina*, state of Paraná, Brazil.

The monotypic genus *Lampronycteris* Sanborn 1949 has been regarded as a subgenus of *Micronycteris* Gray 1866 (Sanborn 1949; Koopman 1994; Simmons 1996). However, recent studies have shown that *Micronycteris* (sensu Sanborn) is not monophyletic, and that *Lampronycteris* and other erstwhile subgenera (*Glyphonycteris*, *Neonycteris*, and *Trinycpteris*) should be restored to generic rank (Simmons and Voss 1998; Wetterer et al. 2000). *Lampronycteris brachyotis* is distributed from Oaxaca (Mexico) to Guyana, French Guiana, and Brazil, including Peru and Trinidad (Simmons 2005). In Brazil, this species occurs in Amazon, *Cerrado*, and Atlantic Forest biomes, with records in Amazonas, Pará, Piauí, Bahia, Tocantins, Espírito Santo and São Paulo states (Figure 1) (Nogueira et al. 2007). However, *L. brachyotis* was not yet recorded in the state of Paraná (Reis et al. 2008), nor in any other state of southern Brazil (Nogueira et al. 2007).

Lampronycteris brachyotis is associated with well preserved habitats and appears to be sensitive to habitat disturbance (Medellín et al. 1983). This bat roosts in hollow trunks of trees, caves, mines, and old buildings (Medellín et al. 1983; Taddei and Pedro 1996). They feed on insects, fruits, nectar and pollen, being classified as gleaning insectivores (Weinbeer and Kalko 2004) or

gleaning omnivores (Kalko et al. 1996). Humprey et al. (1983) found equal amounts of arthropods and fruits in the fecal pellets of this species. Group size is usually small (approximately 10 individuals per colony), although Medellín et al. (1983) have found a sea cave in Veracruz, Mexico, harboring about 300 individuals. Evidence of a polygynous mating system is also available from these latter authors. *L. brachyotis* appeared in the "Least Concern" category of the World Threatened Species List, because it was considered that "given the extent of its range, it is unlikely to be declining rapidly enough to qualify for inclusion in a threat category" (Ochoa et al. 2008).

The specimen collected represents the first record of *L. brachyotis* for the state of Paraná and for southern Brazil, thereby extending southward its known geographical distribution. Currently, 62 species of bats are recorded for Paraná (Reis et al. 2008; Scultroni et al. 2009a; b). This record corroborates the results of other studies (e.g., Miranda et al. 2006a; b; Miranda et al. 2007; Gazarini and Bernardi 2007; Scultroni et al. 2009a; b) that indicate the need for increasing sampling efforts in order to obtain a better knowledge about distribution patterns, natural history, and conservation status of the bat species in Paraná.

Acknowledgments: Our special thanks to the *Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental* (SPVS) for the permission to conduct our research and for their help with the field work logistics at this reserve; to IBAMA and IAP for research authorizations; to Dra. Marlies Sazima for her supervision and support; to the *Programa de Pós-Graduação em Ecologia* at the *Universidade Estadual de Campinas* (UNICAMP); to all who helped in the field work; to Dr. Isaac Passos de Lima for elaboration of the map; to Dra. Marta Fabián and Dr. Michel Miretzki for critics and suggestions; to Idea Wild and FAEPEX for donation of equipment; FAPESP for Msc. scholarship to C. Scultroni; CNPq and FAPERJ for grants to A. L. Peracchi.

Literature cited

Ferretti, A.R. and R.M. Britez. 2006. Ecological restoration, carbon sequestration and biodiversity conservation: The experience of the Society for Wildlife Research and Environmental Education (SPVS) in the Atlantic Rain Forest of Southern Brazil. *Journal for Nature Conservation* 14: 249-259.

Gazarini, J. and I.P. Bernardi. 2007. Mammalia, Chiroptera, Molossidae, *Molossops neglectus*: First record in the State of Paraná, Brazil. *Check List* 3(2): 123-125.

Genoways, H.H. and S.L. Williams. 1986. Results of the Alcoa Foundation – Suriname Expeditions. XI. Bats of the genus *Micronycteris* (Mammalia: Chiroptera) in Suriname. *Annals of the Carnegie Museum* 55: 303-324.

Humphrey, S.R., F.J. Bonaccorso and T.L. Zinn. 1983. Guild structure of surface-gleaning bats in Panama. *Ecology* 64(2): 284-294.

Kalko, E.K.V., C.O. Handley Jr. and D. Handley. 1996. Organization, diversity, and long-term dynamics of a neotropical bat community; p. 503-553. *In* Cody, M.L. and J.A. Smallwood (ed.). *Long-term studies of vertebrate communities*. San Diego: Academic Press.

Koopman, K.F. 1994. Chiroptera: systematics. *Handbuch der Zoologie* [Handbook of Zoology], VIII (Mammalia) 8(60): 1- 217.

Medellín, R.A., D.E. Wilson and D.L. Navarro. 1985. *Micronycteris brachyotis*. Mammalian Species 251: 1-4.

Medellín, R.A., D. Navarro, W.B. Davis and V.J. Romero. 1983. Notes on the biology of *Micronycteris brachyotis* (Dobson) (Chiroptera), in southern Veracruz, Mexico. Breneria 21: 7-11.

Miranda, J.M.D., A. Pulchérlio-Leite, R.F. Moro-Rios and F.C. Passos. 2006a. Primeiro registro de *Histiotus montanus* (Philippi & Landbeck) para o Estado do Paraná, Brasil (Chiroptera, Vespertilionidae). Revista Brasileira de Zoologia 23(2): 584-587.

Miranda, J.M.D., I.P. Bernardi and F.C. Passos. 2006b. A new species of *Eptesicus* (Mammalia: Chiroptera: Vespertilionidae) from the Atlantic Forest, Brazil. Zootaxa 1383: 57-68.

Miranda, J.M.D., A. Pulchérlio-Leite, I.P. Bernardi and F.C. Passos. 2007. Primeiro registro de *Myotis albescens* (É. Geoffroy, 1806) (Chiroptera, vespertilionidae) para o Estado do Paraná, Brasil. Biota Neotropica 7(1): 13-15.

Nogueira, M.R., A.L. Peracchi and R. Moratelli. 2007. Subfamília Phyllostominae; p. 61- 97 In Reis, N.R., A.L. Peracchi, W.A. Pedro and I.P. Lima (ed.). Morcegos do Brasil. Londrina: Editora da Universidade Estadual de Londrina.

Ochoa, J., D. Lew, E. Sampaio, B. Lim, S. Peters, J. Arroyo Cabrales, S.T.A. Castaneda, A.D. Cuarón and P.C. de Grammont. 2008. *Lampronycteris brachyotis*. In IUCN 2009. IUCN Red List of Threatened Species. Version 2009. 1. Eletronic database accessible at www.iucnredlist.org. Captured on 22 July 2009.

Reis, N.R., I.P. Lima and M. Miretzki. 2008. Morcegos do Paraná; p. 125-142. In Reis, N.R., A.L. Peracchi and G.A.D. Santos (ed.). Ecologia de Morcegos. Londrina: Technical Books Editora.

Sanborn, C.C. 1949. Bats of the genus *Micronycteris* and its subgenera. Fieldiana Zoology 31: 215-233.

Scultrori, C., A.L. Peracchi and D. Dias. 2009a. Mammalia, Chiroptera, Phyllostomidae, *Platyrrhinus recifinus*: first record in the State of Paraná, Southern Brazil. Check List 5(2): 238-242.

Scultrori, C., A.L. Peracchi and D. Dias. 2009b. Mammalia, Chiroptera, Phyllostomidae, *Artibeus cinereus*: first record in the state of Paraná, Southern Brazil. Check List 5(2): 325-329.

Simmons, N.B. 1996. A new species of *Micronycteris* (Chiroptera: Phyllostomidae) from Northeastern Brazil, with comments on phylogenetic relationships. American Museum Novitates 3158: 1-34.

Simmons, N.B. 2005. Order Chiroptera; p. 312-529. In Wilson, D.E. and D.M. Reeder (ed.). Mammal species of the world: a taxonomic and geographic reference. Baltimore: The Johns Hopkins University Press.

Simmons, N.B. and R.S. Voss. 1998. The mammals of Paracou, French Guiana: a neotropical lowland rainforest fauna. Part I. Bats. Bulletin of the American Museum of Natural History 273: 1-219.

SOS Mata Atlântica and INPE. 2008. Atlas da Mata Atlântica. Electronic Database accessible at <http://www.sosmatatlantica.org.br/index.php?section=atlas&action=atlas>. Fundação S.O.S. Mata Atlântica, São Paulo, BR. Captured on 20 September 2008.

Straube, F. C. and G. V. Bianconi. 2002. Sobre a grandeza e a unidade utilizada para estimar esforço de captura com utilização de redes-de-neblina. Chiroptera Neotropical 8(1-2): 150-152.

Taddei, V.A. and W. Pedro. 1996. *Micronycteris brachyotis* (Chiroptera, Phyllostomidae) from the state of São Paulo, Brazil. Revista Brasileira de Biologia 56(2): 217-222.

Taddei, V.A., C.A. Nobile, and E. Morielle-Versute. 1998. Distribuição geográfica e análise morfométrica comparativa em *Artibeus obscurus* (Schinz, 1821) e *Artibeus fimbriatus* Gray, 1838 (Mammalia, Chiroptera, Phyllostomidae). Ensaios e Ciência 2(2): 71-27.

Veloso, H.P., A.L.R. Rangel-Filho, and J.C.A. Lima. 1991. Classificação da vegetação brasileira adaptada a um sistema universal. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística, Departamento de Recursos Naturais e Estudos Ambientais. 124 p.

Weinbeer, M. and E.K.V. Kalko. 2004. Morphological characteristics predict alternate foraging strategy and microhabitat selection in the Orange-bellied Bat, *Lampronycteris brachyotis*. Journal of Mammalogy 85(6): 1116-1123.

Wetterer, A.L., M.V. Rockman and N.B. Simmons. 2000. Phylogeny of phyllostomid bats (Mammalia: Chiroptera): Data from diverse morphologic systems, sex chromossomes, and restriction sites. Bulletin of the American Museum of Natural History 248: 1-200.

Received: September 2009

Revised: November 2009

Accepted: November 2009

Published online: December 2009

Editorial responsibility: Marcelo Rodrigues Nogueira